

REPORT DOCUMENTATION PAGE

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14. ABSTRACT

The computer facilities purchased in this grant have had an immediate impact in education and research of materials science at Fisk University. The electron spectrometer at the Physics Department is one of the main instruments, 4-6 graduate and 2-4 undergraduate students are regular users. The instrument is also used for student training in the Summer Undergraduate Research Program, and the course "Materials Structures and Characterization Techniques". A total of about 20-25 students in physics, materials science, and chemistry majors use the instrument each year. The research projects at the Surface Science Group include surface and interface physics on wide band-gap semiconductor, chemical sensing materials, and "soft" processed nano-composites, funded by NASA. The instrument is also used for research and student training of the II-VI semiconductors, the optical materials, and the chemical physics groups at the Department. The impact of this project is demonstrated in that the instrumentation are being used for multiple project, groupms, teching and training.

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Fisk Univ

NJ

F49620-01-1-0519

The Final Report for DOD/AFOSR**"Upgrade Computer Facilities for Education and Research"****1. Computer Purchases for the Surface Physics Group****1.1. Data acquisition system of the electron spectrometer**

The existing data system is replaced by a new Sun workstation system. The VISION 2.0 system is a flexible, user-friendly, graphics oriented, windows based system, and includes: Sun ULTRASPARC workstation with 21" monitor, color printer, CD ROM, connection cables, and Vision 2.0 data acquisition and processing software. The purchase was made on October 2001.

Sale Person: Dr. David Surman
Kratos Analytical Inc.
100 Red Schoolhouse Road, Bldg. A
Chestnut Ridge, NY 10977
Phone: (845) 426-6700 Fax: (845) 426-6192, Web address: www.kratos.com

Price: \$17,000 (after Special University Discount: \$4,250)

1.2. PC systems for general uses

- (1) Gateway 700cb desktop, \$1,369 x 4 = \$5,476
- (2) Gateway Solo 5300 LS98 notebook, \$1,499 x 2 = \$2,998
- (3) Printers, HP LJ 1200SE (\$383 x 3 = \$1,149), and HP Photosmart 1218 (\$375)
- (4) Toners, cartridges, photo papers, disks, and RW-CDs (\$697)

Total price: \$10,695

The sales person for the Gateway computers: Laura Woudstra, Gateway Business, 610 Gateway Drive, P. O. Box 2000, North Sioux City, SD 57049 (phone: 1-800-846-2042, ext. 25467)

Total cost for the surface physics group: \$27,695

1.3. Research and Education Projects for the computers**1.4. Data acquisition system of the electron spectrometer**

The computer facilities purchased in this grant have had an immediate impact in education and research of materials science at Fisk University. The materials science portion of the grant has been used to upgrade computer and software for the electron spectrometer. The students and faculty are using these computers on various research/education projects.

The electron spectrometer at the Physics Department is one of the main instruments, 4-6 graduate and 2-4 undergraduate students are regular users. The instrument is also used for student training in the Summer Undergraduate Research Program, and the course "Materials Structures and Characterization Techniques". A total of about 20-25 students in physics, materials science, and chemistry majors use the instrument each year. The research projects at the Surface Science Group include surface and interface physics on wide band-gap semiconductor, chemical sensing materials, and "soft" processed nano-composites, funded by NASA. The instrument is also used for the research and student training of the II-VI semiconductors, the optical materials, and the chemical physics groups at the Department. The impact of this project is demonstrated in that the instrumentation are being used for multiple projects, multiple groups, teaching, and student training.

The list of the research and education projects is as follows:

- (1) HBCU/NASA Center for Photonic Materials and Devices,
- (2) "Surface and Interfacial Structures of Metal Thin Film on SiC at Elevated Temperatures".
- (3) "Graphitization and ohmic contacts on SiC"
- (4) "Sol-gel Processed Nano-composite Materials for Optical Limiting"
- (5) "Undergraduate Student Training in Materials Characterization Techniques"
- (6) "Studies of chalcopyrite semiconductor crystals"
- (7) "Characterizations of explosive particles"

1.5. PC for general uses

Currently, the PCs are used by the students and faculty at the Surface Science Laboratory. Two computers have been placed at the labs for the students in their thesis writing, data processing, and the internet access. Other two computers are used by the faculty. A printer is used for the atomic force microscopy. Currently, two graduate and five undergraduate students are working at the Surface Science Group.

• Graduate Students

1. Candis Thornton (carbon films on SiC, graduated in May 2002, currently employed at Trevecca Nazarene University as assistant director of the continuing education program).
2. Melvin Hunt (sol-gel processed nano-composites, expected to graduate in May 2003)
3. Abisoye Mudasiru (ohmic contacts on SiC, enrolled in Fall 2002)

• Undergraduate Students

1. Vanca Pharr (ohmic contact on SiC, 2002 Summer Program)
2. Adrian Brown (ohmic contact on SiC, 2002 Summer Program)
3. Karissa McCall (Bacteria morphology)
4. Jonathan Raymond (SiC contacts)
5. Julian Austin (Bacteria morphology)
6. Dap Akingbade (ohmic contacts on SiC)
7. Olabode Apbole (Ohmic contacts on SiC)

2. Computer Purchases for the Mathematics Laboratory of the Learning Resources Center**2.1. PCS for tutoring and advanced mathematical uses**

Fourteen PC systems's from Okorai Technologies, Inc @ \$1055

Total price: \$15,825

Three PC's from Ovations systems Technologies, Inc @ \$ 659

Five PC's from Ovations systems Technologies, Inc @ \$ 628

Eight Monitors from Ovations systems Technologies, Inc @ \$ 119

Total price: \$ 6070

Total cost for the Mathematics laboratory activities: \$21,895

2.2. Education Projects for the computers

The computer facilities purchased in this grant have had an immediate impact in education at Fisk University. The university has provided Mathematical and other software for use on the computers. Between the hours of 2:00 p.m. and 8:00 p.m., the computers allow for self guided exercises and tutorial experiences via installed software or via special sites connected with the internet. In addition, tutors are available to assist students in mathematics as well as the sciences, and may use the computers to assist in their tutoring.

The Chemistry Gaussian Computational package was installed on each computer for training and use in organic chemistry classes and the Mathematical package was installed for use in advanced mathematics courses.. Additionally, mathematical was made a requirement for the differential equations course. The use of mathematical, and other software will be expanded to include other courses in the sciences and mathematics. Undergraduate students have also used the mathematical package to do simulations associated with undergraduate research.

The facilities are also available for use by instructors to use with classroom instruction between 8:00 a.m. and 12:00 noon. During the first year, it has primarily been used for teaching the mathematical software in the differential equations course.

3. Computer Purchases for the Chemistry Center**3.1. PCS for Chemical Modeling**

Four PC's from Sony Company @ 1715*4 = \$6860

Plus GaussianView with site license @ 2010

Total price: \$8070

Total cost for the Chemistry group: \$8,070

3.2. Education and Research Projects for the computers

Five research undergrad assistants have directly benefited with computational projects. Two to three new students per year will be directly involved with these computers doing research using the Chemistry Gaussian Computational package. One research paper is in press.

4.0 TOTAL Equipment and accessories Cost:

Total cost for the surface physics group:.....	\$27,695
Total cost for the Mathematics laboratory activities:.....	\$21,895
Total cost for the Chemistry group:.....	<u>\$ 8,070</u>
TOTAL	\$ 58,020